

IN THE UNITED STATES PATENT OFFICE AS THE INTERNATIONAL
PRELIMINARY EXAMINATION AUTHORITY

Applicant : NOLEN, Gary
Int'l Application No. : PCT/US03/35933
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Priority Date : 12 November 2002
Title of the Invention : Application system with recycle and related use of antimicrobial
quaternary ammonium compound

RESPONSE TO WRITTEN OPINION UNDER PCT RULE 66

Mail Stop PCT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attn: Helen F. Pratt
Authorized Officer

In accordance with PCT Rule 66, Applicants provide the following comments in response to the Written Opinion mailed on 19 October 2004. A response is due within 2 months of this mail date, thus making 19 December 2004 the timely response date.

REMARKS

Applicant herewith provides substitute pages 17-21a containing new claims 1-34. The claims are supported in the original specification or claims as shown on the marked up copy of the claims. No new matter has been added to the claims.

Applicant notes that the Examiner states that claims 1-31 possess novelty, claim 17 possesses an inventive step and claims 1-31 possess industrial applicability.

Response to Box No. V

Claims 1-7 (Nafisi-Movaghar)

The Examiner alleges that claims 1-7 lack an inventive step under PCT Article 33(3) as being obvious over Nafisi-Movaghar. As discussed in more detail below, Applicant respectfully traverses this allegation. The Examiner states, in part, that "[t]he solution is seen to have been

diluted because in any infusion process, water is replaced by the infusing solution due to the difference in concentration (col. 10, lines 15-18).” Claim 1 provides in part (emphasis added):

- (2) applying said composition to a first workpiece;
- (3) after step (2), diverting a portion of said composition;
- (4) diluting said diverted composition;
- (5) determining a concentration of said first component in said diluted composition

According to claim 1, the composition is applied to the workpiece in step (2), then “after step (2),” a portion of the composition is diverted, the diverted composition is diluted, and a concentration of the diluted composition is determined. In contrast, the dilution that occurs during the infusion process of Nafisi-Movaghar takes place while the composition is being applied to the workpiece, not after a portion of the composition is diverted, as called for by claim 1. It is respectfully submitted that Nafisi-Movaghar does not disclose, teach, or suggest applying the composition to a workpiece, then diverting a portion of the composition, and diluting the diverted composition.

Claims 2-7 depend ultimately from claim 1 so distinguish over, are patentable over, and possess an inventive step over Nafisi-Movaghar for the same reasons as claim 1. It is therefore requested that this rejection be withdrawn and that the Examiner indicate that claims 1-7 possess an inventive step and satisfy the requirements of PCT Art. 33(3).

Claims 8-15 (Nafisi-Movaghar in view of Bowden)

The Examiner alleges that claims 8-15 lack an inventive step under PCT Article 33(3) as being obvious over Nafisi-Movaghar in view of Bowden. In response, Applicant has amended claim 8 to provide for, among other things, a conveyor and a “plurality of workpieces selected from the group consisting of meat, poultry, and fresh and salt water seafood.” This amendment finds support, among other places, at page 4, lines 15-18. In contrast, Nafisi-Movaghar is directed toward immersing fruit in a solution to extract flavor from the fruit, and Bowden is directed toward “batch washing, rinsing and rust inhibiting industrial parts.” It is respectfully submitted that neither Nafisi-Movaghar nor Bowden disclose, teach, or suggest the use of a conveyor passing through a housing, the conveyor carrying workpieces selected from the group consisting of meat, poultry, and fresh and salt water seafood.

Claims 9-12 depend ultimately from claim 8 so distinguish over, are patentable over, and possess an inventive step over Nafisi-Movaghar in view of Bowden for the same reasons as claim 8. It is therefore requested that this rejection be withdrawn and that the Examiner

indicate that claims 8-12 possess an inventive step and satisfy the requirements of PCT Art. 33(3).

With respect to claim 13, the Examiner also alleges:

Antimicrobials are disclosed in Nafisi-Movaghar (col. 11, lines 45-55) and the use of filters between the tank and the pump. As filters are well known, it would have been obvious to place them at strategic spots. Therefore, it would have been obvious to use antimicrobials in the process of the combined references and to place filters where needed.

In response, Applicant has amended claim 13 to provide for, among other things, a conveyor and a “plurality of workpieces selected from the group consisting of meat, poultry, and fresh and salt water seafood.” This amendment finds support, among other places, at page 4, lines 15-18. In contrast, Nafisi-Movaghar is directed toward immersing fruit in a solution to extract flavor from the fruit, and Bowden is directed toward “batch washing, rinsing and rust inhibiting industrial parts.” It is respectfully submitted that neither Nafisi-Movaghar nor Bowden disclose, teach, or suggest the use of a conveyor passing through a housing, the conveyor carrying workpieces selected from the group consisting of meat, poultry, and fresh and salt water seafood.

The amendment of claim 13 necessitated amendments to claims 14 and 15, for agreement with amended claim 13. The amendments to claims 14 and 15 were not made for reasons related to patentability but were made simply so that claims 14 and 15 would agree with claim 13 as amended. Claims 14 and 15 depend ultimately from claim 13 so distinguish over, are patentable over, and possess an inventive step over Nafisi-Movaghar in view of Bowden for the same reasons as claim 13. It is therefore requested that this rejection be withdrawn and that the Examiner indicate that claims 13-15 possess an inventive step and satisfy the requirements of PCT Art. 33(3).

Claims 16, 18-23 (Nafisi-Movaghar in view of Bowden and Fricker et al.)

The Examiner alleges that claims 16 and 18-23 lack an inventive step under PCT Article 33(3) as being obvious over Nafisi-Movaghar in view of Bowden and Fricker et al. The Examiner has indicated that claim 17 possesses an inventive step. In response, Applicant has deleted claim 17 and amended claim 16 to incorporate the limitations of claim 17. It is therefore submitted that claim 16, as amended, distinguishes over, is patentable over, and possesses an inventive step over Nafisi-Movaghar in view of Bowden and Fricker et al. for the same reasons as claim 17.

The cancellation of claim 17 required renumbering of later claims. The amendment of claim 16 necessitated an amendment to claim 17 (previously claim 18), for agreement with amended claim 16. The amendment to claim 17 was not made for reasons related to patentability but was made simply so that claim 17 would agree with claim 16 as amended. Claims 17-19 (previously 18-20) depend ultimately from claim 16 so distinguish over, are patentable over, and possess an inventive step over Nafisi-Movaghar in view of Bowden and Fricker et al. for the same reasons as claim 16. It is therefore requested that this rejection be withdrawn and that the Examiner indicate that claims 16-19 possess an inventive step and satisfy the requirements of PCT Art. 33(3).

New claims 30-32 were also added. New claim 30 is similar to original claim 16 but specifies "providing a conveyor for moving a plurality of poultry carcasses" and also specifies that the first composition comprises "a quaternary ammonium compound and water." This finds support, among other places, at page 4, lines 15-20. It is respectfully submitted that claim 30 and dependent claims 31 and 32 distinguish over, are patentable over, and possess an inventive step over Nafisi-Movaghar in view of Bowden and Fricker et al.

With respect to claim 21 (now claim 20), the Examiner alleges, in part, that:

Bowden discloses the use of sensors in the wash tank (col. 8, lines 1-11). They are on rigid supports (120 of fig. 2). Nothing new is seen in providing seals over the openings to protect the sensors which would not operate correctly. Therefore, it would have been obvious to provide sensors and lenses.

In response, claim 20 (previously claim 21) has been amended to specify "counters." It is respectfully submitted that claim 20, as amended, distinguishes over, is patentable over, and possesses an inventive step over Nafisi-Movaghar in view of Bowden and Fricker et al. Bowden discloses a method for batch washing, rinsing and rust inhibiting industrial parts. Bowden does not disclose, teach or suggest the use of a conveyor, does not disclose, teach, or suggest the use of a rigid member having first and second portions extending on opposite sides of a conveyor, does not disclose, teach, or suggest affixing the rigid member to a downstream end of the housing, does not disclose, teach, or suggest providing openings in those first and second portions, does not disclose, teach, or suggest the use of a single counter, much less the use of counters, does not disclose, teach, or suggest placing such counters in openings in those first and second portions, and does not disclose, teach, or suggest using lenses secured to the rigid member to provide a water resistant seal over the openings.

The amendment of claim 20 necessitated an amendment to claims 21 and 22 (previously claims 22 and 23), for agreement with amended claim 20. The amendments to claims 21 and 22 were not made for reasons related to patentability but were made simply so that claims 21 and 22 would agree with claim 20 as amended. Claims 21 and 22 depend ultimately from claim 20 so distinguish over, are patentable over, and possess an inventive step over Nafisi-Movaghar in view of Bowden and Fricker et al. for the same reasons as claim 20. It is therefore requested that this rejection be withdrawn and that the Examiner indicate that claims 20-22 possess an inventive step and satisfy the requirements of PCT Art. 33(3).

Claims 24-31 (Christianson et al., Nafisi-Movaghar, Bowden, and Fricker et al)

The Examiner alleges that claims 24-31 lack an inventive step under PCT Article 33(3) as being obvious over Christianson et al. in view of Nafisi-Movaghar, Bowden, and Fricker et al. In response, Applicant has deleted original claim 29 and amended claim 23 (previously claim 24) to incorporate the limitations of original claim 29. Similar to claim 1 discussed above, claim 23 calls for “diverting a portion of said first composition; diluting said diverted composition; and determining a concentration of said quaternary ammonium compound in said diluted composition.” In contrast, the dilution that occurs during the infusion process of Nafisi-Movaghar takes place while the composition is being applied to the workpiece, not after a portion of the composition is diverted, as called for by claim 23. It is respectfully submitted that Nafisi-Movaghar does not disclose, teach, or suggest applying the composition to a workpiece, then diverting a portion of the composition, and diluting the diverted composition.

Claims 24-29 (previously claims 25-28 and 30-31) depend ultimately from claim 23 so distinguish over, are patentable over, and possess an inventive step over Christianson et al., in view of Nafisi-Movaghar, Bowden, and Fricker et al. for the same reasons as claim 23. It is therefore requested that this rejection be withdrawn and that the Examiner indicate that claims 23-29 possess an inventive step and satisfy the requirements of PCT Art. 33(3).

New claims 30-32 have been discussed above.

New claim 33 depends from claim 23 so distinguishes over, is patentable over, and possesses an inventive step over Christianson et al., in view of Nafisi-Movaghar, Bowden, and Fricker et al. for the same reasons as discussed above in connection with claim 23. New claim 33 finds support, among other places, at page 10, lines 20-25. It is therefore requested that the Examiner indicate that claim 33 possesses an inventive step and satisfies the requirements of PCT Art. 33(3).

New claims 34 depends from claim 8 and claim 13 so distinguishes over, is patentable over, and possesses an inventive step over the prior art of record for the same reasons discussed above in connection with claims 8 and 13. New claim 34 finds support, among other places, at page 4, lines 15-18. It is therefore requested that the Examiner indicate that claim 34 possesses an inventive step and satisfies the requirements of PCT Art. 33(3).

CONCLUSION

In light of the foregoing arguments, Applicant requests that the Examiner reconsider her position on the examination of claims 1-31. Applicant believes that the application is now in condition for the issuance of a positive International Preliminary Examination Report for claims 1-34, and the same is respectfully requested. Should the Examiner have further concerns regarding this application or if she believes that an interview would be helpful in resolving any issues, she is invited to telephone the undersigned.

Respectfully submitted,

12-17-04
Date

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Marked-up claims showing amendments

What is claimed is:

1. A method, comprising:
 - (1) providing a composition, said composition comprising a first component and a second component;
 - (2) applying said composition to a first workpiece;
 - (3) after step (2), diverting a portion of said composition;
 - (4) diluting said diverted composition;
 - (5) determining a concentration of said first component in said diluted composition; and
 - (6) introducing an additional amount of said first component into said composition if said concentration falls below a desired value.
2. The method of claim 1, further comprising, after step (2), reapplying said composition to a second workpiece.
3. The method of claim 1, wherein said first ~~composition~~ component comprises an antimicrobial.
4. The method of claim 3, wherein said first workpiece comprises a raw, hide-on, carcass, cooked, prepared, processed, partially processed, ready to eat, or ready to cook food.
5. The method of claim 1, wherein:
 - step (2) comprises applying said composition to said first workpiece in a housing; and
 - step (6) comprises introducing said additional amount of said first component into said housing for mixing with said composition if said concentration falls below said desired value.
6. The method of claim 1, further comprising:
 - after step (5), passing said diluted composition to a first tank; and
 - passing at least a portion of contents of said first tank through a separator to selectively remove at least a portion of said first component from said diluted composition.
7. The method of claim 6, further comprising, after step (2), passing at least a portion of said composition to said first tank.
8. A combination, comprising:
 - a housing;
 - a sprayer disposed within said housing;
 - a conveyor passing through said housing;
 - a plurality of workpieces carried by said conveyor, said plurality of workpieces selected

from the group consisting of meat, poultry, and fresh and salt water seafood;

a first tank;

a first composition disposed in said first tank, said first composition comprising a first component in a first concentration;

a first conduit extending between said first tank and said housing;

a second tank;

a second composition disposed in said second tank, said second composition comprising said first component in a second concentration, said second concentration being less than said first concentration;

a second conduit extending between said second tank and said sprayer; and

means for passing said first composition from said first tank into said housing in response to a decrease in said second concentration.

9. The combination of claim 8, further comprising a third conduit extending between said second tank and said housing.

10. The combination of claim 8 wherein said means for passing said first composition from said first tank into said housing in response to said decrease in said second concentration comprises:

means for detecting a decrease in said second concentration;

a pump operably connected to said first conduit; and

a controller operably connected to said means for detecting said decrease in said second concentration and to said pump.

11. The combination of claim 10, wherein said means for detecting said decrease in said second concentration comprises:

means for diluting said second concentration to a third concentration; and

means for detecting a change in said third concentration.

12. The combination of claim 11, wherein said means for detecting said change in said third concentration comprises a spectrophotometer.

13. A combination, comprising:

a housing;

a conveyor passing through said housing;

a plurality of workpieces carried by said conveyor, said plurality of workpieces selected from the group consisting of meat, poultry, and fresh and salt water seafood;

a tank;

an antimicrobial disposed in said tank, said tank being connected to said housing for

receiving said antimicrobial as said antimicrobial passes from said housing ;
a pump;
first and second filters operably connecting said tank and said pump, said first and second filters being disposed to provide for parallel flow between said tank and said pump;
means for selectively directing said antimicrobial passing from said tank to said pump through said first filter or said second filter; and
a conduit extending from said pump to said housing.

14. The combination of claim 13, further comprising:

~~a conveyor, said conveyor being disposed to pass workpieces through said housing; and~~
a sprayer, said sprayer being operably connected to said conduit and at least a portion of said sprayer being disposed within said housing.

15. The combination of claim 14, wherein said plurality of workpieces ~~comprise~~ are raw, hide-on, carcass, cooked, prepared, processed, partially processed, ready to eat, or ready to cook food.

16. A method, comprising:

(1) providing a conveyor for moving a plurality of workpieces;
(2) providing a first composition, said first composition comprising an antimicrobial and water;
(3) applying said first composition to one of said plurality of workpieces;
(4) after step (3), capturing said first composition;
(5) applying said captured first composition to another of said plurality of workpieces;
and
(6) after step (5), passing said first composition through a carbon filter for selectively removing said antimicrobial from said first composition.

17. (previously claim 18) The method of claim 16, wherein step (6) comprises:

after step (5), passing said first composition to a tank; and
when said first composition reaches a desired level in said tank, passing said first composition from said tank through a said carbon filter for selectively removing said antimicrobial from said first composition.

18. (previously claim 19) The method of claim 16, wherein said plurality of workpieces comprises meat, poultry, ~~fish~~, fresh or salt water seafood, fruits, vegetables, other foodstuffs; or animals, food packaging, or items or surfaces related to food or food processing; or combinations thereof.

19. (previously claim 20) The method of claim 16, further comprising:

between step (4) and step (5), monitoring said first composition for a decrease in concentration of said antimicrobial in said first composition; and introducing an additional amount of said antimicrobial into said first composition if a predetermined decrease in concentration is detected.

20. (previously claim 21) A combination, comprising:

a housing;

a sprayer disposed within said housing;

a conveyor, said conveyor being disposed to pass workpieces through said housing, said workpieces comprising a raw, hide-on, carcass, cooked, prepared, processed, partially processed, ready to eat, or ready to cook food;

a rigid member affixed to a downstream end of said housing, said rigid member having first and second portions extending on opposite sides of said conveyor and having a plurality of openings in said first portion and in said second portion;

~~sensors~~ counters disposed within each of said openings;

a plurality of lenses secured to said rigid member to provide a water resistant seal over each said plurality of openings.

21. (previously claim 22) The combination of claim 21 ~~20~~, wherein said ~~sensors~~ counters comprise:

a first ~~sensor~~ counter component disposed in one of said plurality of openings in said first portion;

a matching second ~~sensor~~ counter component disposed in one of said plurality of openings in said second portion, said first and second ~~sensor~~ counter components being disposed and aligned so that workpieces being carried by said conveyor block a line of sight between said first and second ~~sensor~~ counter components as said workpieces pass between said first and second ~~sensor~~ counter components.

22. (previously claim 23) The combination of claim 22 ~~21~~, wherein said ~~sensors~~ counters further comprise:

a third ~~sensor~~ counter component disposed in another of said plurality of openings in said first portion;

a matching fourth ~~sensor~~ counter component disposed in another of said plurality of openings in said second portion, said third and fourth ~~sensor~~ counter components being disposed and aligned so that workpieces being carried by said conveyor block a line of sight between said third and fourth ~~sensor~~ counter components as said workpieces pass between said third and fourth ~~sensor~~ counter components, said third and fourth ~~sensor~~

counter components being disposed downstream of said first and second ~~sensor~~ counter components.

23. (previously claim 24) A method, comprising:

(1) providing a conveyor for moving a plurality of workpieces, said workpieces comprising raw, hide-on, carcass, cooked, prepared, processed, partially processed, ready to eat, or ready to cook food;

(2) providing a first composition, said first composition comprising a quaternary ammonium compound and water;

(3) applying said first composition to said plurality of workpieces;

(4) simultaneously with step (3), monitoring a concentration of said quaternary ammonium compound in said first composition, said step of monitoring said concentration of said quaternary ammonium compound in said first composition comprising:

diverting a portion of said first composition;

diluting said diverted composition; and

determining a concentration of said quaternary ammonium compound in said diluted composition; and

(5) adding an additional amount of said quaternary ammonium compound to said first composition if said concentration falls below a desired level.

24. (previously claim 25) The method of claim 24 23, wherein step (2) comprises providing said first composition, said first composition comprising an alkylpyridinium chloride and water.

25. (previously claim 26) The method of claim 24 23, wherein step (2) comprises providing said first composition, said first composition comprising a cetylpyridinium chloride and water.

26. (previously claim 27) The method of claim 24 23, wherein step (2) comprises providing said first composition, said first composition comprising a cetylpyridinium chloride, a solubility enhancing agent, and water.

27. (previously claim 28) The method of claim 24 23, wherein step (2) comprises providing said first composition, said first composition comprising a cetylpyridinium chloride, propylene glycol, and water.

28. (previously claim 30) The method of claim 24 23, further comprising:
after step (3), capturing said first composition; and
applying said captured first composition to another of said plurality of workpieces.

29. (previously claim 31) The method of claim 24 23, further comprising:
after step (3), selectively removing said quaternary ammonium compound from said first composition.
30. (new) A method, comprising:
- (1) providing a conveyor for moving a plurality of poultry carcasses;
 - (2) providing a first composition, said first composition comprising a quaternary ammonium compound and water;
 - (3) applying said first composition to one of said plurality of poultry carcasses;
 - (4) after step (3), capturing said first composition;
 - (5) applying said captured first composition to another of said poultry carcasses; and
 - (6) after step (5), selectively removing said quaternary ammonium compound from said first composition.
31. (new) The method of claim 30, wherein said quaternary ammonium compound comprises an alkylpyridinium chloride.
32. (new) The method of claim 30, wherein said quaternary ammonium compound comprises cetylpyridinium chloride.
33. (new) The method of claim 23, further comprising:
refraining from applying said diluted composition to said workpieces.
34. (new) The method of claim 8 or 13 wherein said plurality of workpieces comprise fish or other animals.

What is claimed is:

1. A method, comprising:
 - (1) providing a composition, said composition comprising a first component and a second component;
 - 5 (2) applying said composition to a first workpiece;
 - (3) after step (2), diverting a portion of said composition;
 - (4) diluting said diverted composition;
 - (5) determining a concentration of said first component in said diluted composition; and
 - 10 (6) introducing an additional amount of said first component into said composition if said concentration falls below a desired value.
2. The method of claim 1, further comprising, after step (2), reapplying said composition to a second workpiece.
3. The method of claim 1, wherein said first component comprises an antimicrobial.
- 15 4. The method of claim 3, wherein said first workpiece comprises a raw, hide-on, carcass, cooked, prepared, processed, partially processed, ready to eat, or ready to cook food.
5. The method of claim 1, wherein:
 - step (2) comprises applying said composition to said first workpiece in a housing;
 - 20 and
 - step (6) comprises introducing said additional amount of said first component into said housing for mixing with said composition if said concentration falls below said desired value.
6. The method of claim 1, further comprising:
 - 25 after step (5), passing said diluted composition to a first tank; and
 - passing at least a portion of contents of said first tank through a separator to selectively remove at least a portion of said first component from said diluted composition.
7. The method of claim 6, further comprising, after step (2), passing at least a portion of
30 said composition to said first tank.
8. A combination, comprising:
 - a housing;

- a sprayer disposed within said housing;
a conveyor passing through said housing;
a plurality of workpieces carried by said conveyor, said plurality of workpieces
selected from the group consisting of meat, poultry, and fresh and salt water seafood;
5 a first tank;
a first composition disposed in said first tank, said first composition comprising a
first component in a first concentration;
a first conduit extending between said first tank and said housing;
a second tank;
10 a second composition disposed in said second tank, said second composition
comprising said first component in a second concentration, said second concentration
being less than said first concentration;
a second conduit extending between said second tank and said sprayer; and
means for passing said first composition from said first tank into said housing in
15 response to a decrease in said second concentration.
9. The combination of claim 8, further comprising a third conduit extending between
said second tank and said housing.
10. The combination of claim 8 wherein said means for passing said first composition
from said first tank into said housing in response to said decrease in said second
20 concentration comprises:
means for detecting a decrease in said second concentration;
a pump operably connected to said first conduit; and
a controller operably connected to said means for detecting said decrease in said
second concentration and to said pump.
- 25 11. The combination of claim 10, wherein said means for detecting said decrease in said
second concentration comprises:
means for diluting said second concentration to a third concentration; and
means for detecting a change in said third concentration.
12. The combination of claim 11, wherein said means for detecting said change in said
30 third concentration comprises a spectrophotometer.
13. A combination, comprising:
a housing;

- a conveyor passing through said housing;
a plurality of workpieces carried by said conveyor, said plurality of workpieces
selected from the group consisting of meat, poultry, and fresh and salt water seafood;
a tank;
5 an antimicrobial disposed in said tank, said tank being connected to said housing for
receiving said antimicrobial as said antimicrobial passes from said housing ;
a pump;
first and second filters operably connecting said tank and said pump, said first and
second filters being disposed to provide for parallel flow between said tank and said
10 pump;
means for selectively directing said antimicrobial passing from said tank to said
pump through said first filter or said second filter; and
a conduit extending from said pump to said housing.
14. The combination of claim 13, further comprising:
15 a sprayer, said sprayer being operably connected to said conduit and at least a portion
of said sprayer being disposed within said housing.
15. The combination of claim 14, wherein said plurality of workpieces are raw, hide-on,
carcass, cooked, prepared, processed, partially processed, ready to eat, or ready to
cook.
- 20 16. A method, comprising:
(1) providing a conveyor for moving a plurality of workpieces;
(2) providing a first composition, said first composition comprising an antimicrobial
and water;
(3) applying said first composition to one of said plurality of workpieces;
25 (4) after step (3), capturing said first composition;
(5) applying said captured first composition to another of said plurality of
workpieces; and
(6) after step (5), passing said first composition through a carbon filter for selectively
removing said antimicrobial from said first composition.
- 30 17. The method of claim 16, wherein step (6) comprises:
after step (5), passing said first composition to a tank; and
when said first composition reaches a desired level in said tank, passing said first

composition from said tank through said carbon filter for selectively removing said antimicrobial from said first composition.

18. The method of claim 16, wherein said plurality of workpieces comprises meat, poultry, fresh or salt water seafood, fruits, vegetables, other foodstuffs or animals, food packaging, or items or surfaces related to food or food processing, or combinations thereof.

19. The method of claim 16, further comprising:

between step (4) and step (5), monitoring said first composition for a decrease in concentration of said antimicrobial in said first composition; and

introducing an additional amount of said antimicrobial into said first composition if a predetermined decrease in concentration is detected.

20. A combination, comprising:

a housing;

a sprayer disposed within said housing;

a conveyor, said conveyor being disposed to pass workpieces through said housing, said workpieces comprising a raw, hide-on, carcass, cooked, prepared, processed, partially processed, ready to eat, or ready to cook food;

a rigid member affixed to a downstream end of said housing, said rigid member having first and second portions extending on opposite sides of said conveyor and having a plurality of openings in said first portion and in said second portion; counters disposed within each of said openings;

a plurality of lenses secured to said rigid member to provide a water resistant seal over each said plurality of openings.

21. The combination of claim 20, wherein said counters comprise:

a first counter component disposed in one of said plurality of openings in said first portion;

a matching second counter component disposed in one of said plurality of openings in said second portion, said first and second counter components being disposed and aligned so that workpieces being carried by said conveyor block a line of sight between said first and second counter components as said workpieces pass between said first and second counter components.

22. The combination of claim 21, wherein said counters further comprise:

- a third counter component disposed in another of said plurality of openings in said first portion;
- a matching fourth counter component disposed in another of said plurality of openings in said second portion, said third and fourth counter components being disposed and aligned so that workpieces being carried by said conveyor block a line of sight between said third and fourth counter components as said workpieces pass between said third and fourth counter components, said third and fourth counter components being disposed downstream of said first and second counter components.
- 5
23. A method, comprising:
- 10 (1) providing a conveyor for moving a plurality of workpieces, said workpieces comprising raw, hide-on, carcass, cooked, prepared, processed, partially processed, ready to eat, or ready to cook food;
- (2) providing a first composition, said first composition comprising a quaternary ammonium compound and water;
- 15 (3) applying said first composition to said plurality of workpieces;
- (4) simultaneously with step (3), monitoring a concentration of said quaternary ammonium compound in said first composition, said step of monitoring said concentration of said quaternary ammonium compound in said first composition comprising:
- 20 diverting a portion of said first composition;
- diluting said diverted composition; and
- determining a concentration of said quaternary ammonium compound in said diluted composition; and
- (5) adding an additional amount of said quaternary ammonium compound to said first composition if said concentration falls below a desired level.
- 25
24. The method of claim 23, wherein step (2) comprises providing said first composition, said first composition comprising an alkylpyridinium chloride and water.
25. The method of claim 23, wherein step (2) comprises providing said first composition, said first composition comprising a cetylpyridinium chloride and water.
- 30 26. The method of claim 23, wherein step (2) comprises providing said first composition, said first composition comprising a cetylpyridinium chloride, a solubility enhancing agent, and water.

27. The method of claim 23, wherein step (2) comprises providing said first composition, said first composition comprising a cetylpyridinium chloride, propylene glycol, and water.
28. The method of claim 23, further comprising:
- 5 after step (3), capturing said first composition; and
 applying said captured first composition to another of said plurality of workpieces.
29. The method of claim 23, further comprising:
- after step (3), selectively removing said quaternary ammonium compound from said first composition.
- 10 30. A method, comprising:
- (1) providing a conveyor for moving a plurality of poultry carcasses;
- (2) providing a first composition, said first composition comprising a quaternary ammonium compound and water;
- (3) applying said first composition to one of said plurality of poultry carcasses;
- 15 (4) after step (3), capturing said first composition;
- (5) applying said captured first composition to another of said plurality of poultry carcasses; and
- (6) after step (5), selectively removing said quaternary ammonium compound from said first composition.
- 20 31. The method of claim 30, wherein said quaternary ammonium compound comprises an alkylpyridinium chloride.
32. The method of claim 30, wherein said quaternary ammonium compound comprises cetylpyridinium chloride.
33. The method of claim 23, further comprising:
- 25 refraining from applying said diluted composition to said workpieces.
34. The method of claim 8 or 13 wherein said plurality of workpieces comprise fish or other animals.